



Center for Space Power

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NASA Center for
Commercial
Development
(Space)

6 January 1995

25 WERC
Orlando Station
Texas 77843-8110

Honorable Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street
Washington, DC 20554

109:845-8:56
dx 409:84-1885

JAN 10 1995

Dear Mr. Chairman:

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re: Notice of Proposed Rule Making: ET Docket No 94—32

I am writing concerning the proposed reallocation of radio frequency in the Industrial, Scientific and Medical (ISM) Band at 2402—2417 MHz. I am strongly opposed to the current proposal to reallocate the ISM band for communications use. While I recognize the expanding frequency requirements for communications, I believe it is not in the national interest to permit the encroachment of communications activities into the ISM band.

One reason to maintain the ISM band is that current, important scientific research into wireless power transmission is focused on 2450 MHz in the ISM band. A second and ultimately more important reason is the development of a satellite system to convert solar energy for terrestrial use (Solar Power Satellite) This satellite depends strongly for near term implementation and economic viability on the availability of the 2450 MHz frequency in the ISM band for wireless power transmission.

A recent international workshop¹ found the following:

- Providing economical, clean energy for the Earth's present and growing population is a moral, political, environmental and economic imperative
- Solar power from space can provide part of the solution to the global need for energy
- Excellent technical progress has been made in wireless power transmission, robotic construction and energy conversion technologies
- International activities in space power transmission to Earth are growing.

The Center for Space Power (CSP), a NASA-supported Center for the Commercial Development of Space, has sponsored research in wireless power transmission at microwave frequency to beam energy from point to point both within space and on the Earth, and from space to Earth. Results of work carried out by our researchers and many others have shown that the optimum frequency for early application of wireless power transmission, particularly in bringing ecologically sound, environmentally friendly electric power from space, is centered about 2450 MHz in the ISM band.

There are two major reasons for the overwhelming superiority of the 2450 MHz frequency for wireless power transmission of energy from space to Earth. First, this frequency lies at a minimum for atmospheric absorption, which means a greater fraction of the energy transmitted

Texas Engineering
Experiment Station
The Texas A&M
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¹Personal communication from *International Space Cooperation: Getting Serious About How*, 4—
9 December 1994, Hawaii

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from space will be received on Earth. Second, the energy density of the beam at 2450 MHz is sufficiently low as to not pose a threat to any biota which enters its path (migratory birds, for example, would not be affected by flying through a 2450 MHz beam originating in space).

Currently, the United States is the world leader in the application of wireless power transmission technology. U.S. companies have been formed to utilize wireless power transmission. One proposed application uses microwaves to power a high-altitude radio relay platform based on a Canadian prototype using power beamed at 2450 MHz.

A second commercial application of wireless power transmission is a Solar Power Satellite to provide solar power to Earth. This system is based on 2450 MHz technology developed and tested by NASA (ground-to-ground test at the Goldstone Deep Space Tracking Station); CSP and Texas A&M University (joint U.S.-Japanese space microwave transmission experiment); and Kansai Electric Company (small scale ground-to-ground experiment).

In addition to wireless power transmission uses of great interest to the nation, the ISM band is also important to a variety of industrial applications in the processing, coating and food industries.

Current research efforts as well as future commercial applications would be in jeopardy if the ISM band is reassigned to communications. Therefore, **THE CENTER FOR SPACE POWER URGES THE FEDERAL COMMUNICATIONS COMMISSION NOT TO REALLOCATE THE INDUSTRIAL, SCIENTIFIC AND MEDICAL BAND 2402—2417 MHz TO COMMUNICATIONS SERVICES.**

Respectfully,

A handwritten signature in cursive script, reading "Frank Little".

Frank E. Little
Associate Director